

Response
Serial No. 10/604,891
Attorney Docket No. 031032

AMENDMENTS TO THE CLAIMS:

The following listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently amended) A semiconductor device including a gate having a gate insulation film and a gate electrode, a source, and a drain, said semiconductor device comprising:

a sidewall film covering a side surface of said gate; and
a low permittivity region locally provided at a lower portion of the side surface of said gate with the low permittivity region being covered by said sidewall film,
wherein said gate insulation film and a lower end of said gate electrode have a same width as each other.

2. (Original) The semiconductor device according to claim 1, wherein said low permittivity region is made of a lower permittivity material as compared to said sidewall film.

3. (Original) The semiconductor device according to claim 2, wherein said sidewall film includes

a first film directly formed at an upper portion of said side surface of said gate, and

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a second film formed on said first film to cover said low permittivity region directly formed at the lower portion of the side surface of said gate.

4. (Original) The semiconductor device according to claim 1, wherein said low permittivity region is a cavity.

5. (Original) The semiconductor device according to claim 4, wherein said sidewall film includes

a first film directly formed only at an upper portion of said side surface of said gate, and

a third film covering said first film to form the cavity only at a lower portion of said side surface.

6. (Original) The semiconductor device according to claim 1, wherein a part of a side wall lower portion of said gate is removed to have said low permittivity region formed into a notched shape.

7. (Original) The semiconductor device according to claim 6, wherein said low permittivity region is made of a lower permittivity material as compared to said sidewall film.

8. (Original) The semiconductor device according to claim 6, wherein said low permittivity region is a cavity.

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9. (Withdrawn): A method for manufacturing a semiconductor device including a gate, a source, and a drain, said method comprising the steps of:

forming a thin first film covering a side surface of said gate;

removing only a lower portion of said first film;

locally filling only a lower portion of the side surface of said gate, at which said first film is removed, with a low permittivity material; and

forming a second film on said first film to cover said low permittivity material.

10. (Withdrawn): A method for manufacturing a semiconductor device including a gate, a source, and a drain, said method comprising the steps of:

forming a thin first film covering a side surface of said gate;

removing only a lower portion of said first film; and

forming a second film on said first film with low step coverage, to thereby form a cavity at a lower portion of the side surface of said gate.

11. (Withdrawn): A method for manufacturing a semiconductor device including a gate, a source, and a drain, said method comprising the steps of:

removing a part of a side wall lower portion of said gate to process it into a notched shape;

locally filling only said part with a low permittivity material; and

forming a sidewall film on a side surface of said gate to cover said low permittivity material.

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12. (Withdrawn): A method for manufacturing a semiconductor device including a gate, a source, and a drain, said method comprising the steps of:

removing a part of a side wall lower portion of said gate to process it into a notch shape; and

forming a sidewall film on a side surface of said gate with low step coverage to such an extent as not to fill in said part, to thereby form a cavity at a lower portion of the side surface of said gate.